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NRO REVIEW COMPLETED

16 April 1962

MEMORANDUM FOR : Chief, Development Branch, DFO

SUBJECT : Trip Report

1. PURPOSE: A trip was made 13 through 17 April primarily to monitor loading operation on Mission 9032 and attend an SETD meeting on CORONA/MURAL. A side trip was made to see [redacted] on his ORCA camera and potential use as a consultant for the Configuration Control Board on CORONA.

2. [redacted] I visited [redacted] at his facility in [redacted] the afternoon of 13 April 1962.

(a) ORCA Camera: The majority of fabrication of components modifying the Hycon "B" configuration for use in the ORCA vehicle have been accomplished. The problems of cycling rates and the effect of heat appear to have been satisfactorily resolved. Parts are in-house for modification of the second unit. A decision will be required in the near future regarding whether or not Headquarters intends to make a second camera available for modification. I find that there is currently no plan between [redacted] to test-fly this configuration. I suggested that [redacted] prepare such a plan and submit it to [redacted] for coordination and submission to Headquarters. It is possible that the camera could be ready for installation in the IDEALIST vehicle within thirty days. Since it is a modified "B" configuration, it will require no special hatch and could be rather easily flown in the IDEALIST vehicle. A decision to modify the second camera could perhaps wait until results of tests could be analyzed.

(b) E-E ORCA Camera Mount: I was not aware that [redacted] has a subcontract with Eastman-Kodak to fabricate the vibration isolation mount for [redacted] ORCA camera. This mount is under test with simulated camera weights and is currently exceeding the specification. [redacted] certainly proved to me that while they have a small shoemaker's type shop, they have an especially fine ability to turn out good equipment.

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(c) Optical Windows for ORCANT: [redacted] has been working, at the request of [redacted] on methods of producing the windows for the ORCANT vehicle. A summary report is now available on progress to date on tests of a plastic (Viton) seal for vacuum pack optical windows. The results were excellent and the only problem is the design of a valve system for pumping down to a vacuum after the seal has been conditioned. They are presently pumping down via a valve installed through the glass itself. This procedure is not as desirable as a valve through the seal which would place no extra stress on the surface of the optical flats. A procedure such as the one proposed would undoubtedly require a conditioning and pump down operation on a recurring basis as a part of the operational pre-flight. Tests to date indicate that vacuum could be maintained to a reasonable level for at least twenty hours and probably for several days.

(d) Summitting Mark for CORONA: The Configuration Control Board has previously used [redacted] in the capacity of consultant. Problems occurring on the auxiliary frame camera make it very desirable to call [redacted] in to review the basic design and make a recommendation to the Configuration Control Board in regard to system reliability of this unit. The urgency of the impending flight of Mission 9033 has necessitated having [redacted] make a trip to Palo Alto on 17 April for at least a few days. At this time, the design engineers from Itak will be at LMSC looking into the problems of system compatibility and camera operation. [redacted] and Mr. Parangosky approved calling [redacted] in and he was informed to submit a cost voucher to Headquarters for direct payment of expenses. He will report to Colonel Murphy and submit a report through him to the CCB and Headquarters.

### 3. LOADING OPERATIONS FOR CORONA 9032:

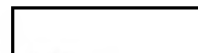
(a) Auxiliary Frame Camera: I proceeded to Vandenberg Air Force Base on 11 April 1962 to participate in a decision regarding the reliability of this item for flight of Mission 9032. Auxiliary frame camera #76 was experiencing intermittent operation with the blame being laid primarily on a mechanical pad. Since there was still an electrical interface problem and a potential mode of failure which could drain the recovery battery, it was decided not to fly this auxiliary frame camera. The camera was removed from the system and a

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light tight seal installed in its place, electrical circuitry and pyrotechnics were disabled (pyros were not installed). Instrument #76 was returned to Palo Alto for installation of a pad made of a harder material and for further testing. It is hoped that either SN 76 or 80 can be installed and tested during HATS with the next HURL system. The HATS test is scheduled to start 15 April and should give us much needed experience with this unit as an integrated part of the system. SN 76 was scheduled for pad system run with H-3 on 16 April and as of the time I left, verbal reports indicated it had operated satisfactorily through this pad run (it was only required to operate two cycles).

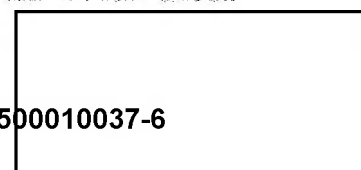
(b) Main Instrument: The primary payload system was loaded on 15 April 1962. This loading operation went very smoothly, visual and telemetry checks indicated that the instruments were operating perfectly. I did find that the horizon cameras were still set at 1/50 second and f/4.5. Headquarters had requested that they set the shutter speed at 1/75 second, if possible, as a result of a request from NPIC. It was found that due to the design of the shutter, the intermittent setting between 1/50 and 1/100 was not a positive stop position. Therefore, it was a little hazardous to make this setting without some reasonable testing at this speed. Since NPIC's alternative was to continue to use 1/50 second, this is the setting that was used. The alternative was to have it set at f/8 and 1/50 second, but the lens had already been locked in position for flight.

4. END MEETING: Pending receipt of the formal minutes, the following significant items were discussed.

(a) Design of the Stalley/Frame Camera: It is still anticipated that this item would be available by H-12 if no serious problems arise, and the problems we have been having with the auxiliary frame portion are resolved immediately.

(b) Stability of Product: Itok is continuing its investigations on methods of maintaining film flatness during exposure, but had no significant data to report at this meeting. DSC reported some temperature predictions data on Vehicle 1124 based on H-1 and H-3 HATS data and Vehicle 1123 telemetry data. The actual temperature range being maintained is suspected to be exceeding the desired limits of  $70^{\circ} \pm 10^{\circ}$ . It is even possible that the temperature of the camera compartment could get as high as  $92^{\circ}$  under certain conditions. Itok estimated that this could throw

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focus out as much as 1/1000 of an inch. It was obvious that the data on hand was inadequate to arrive at any firm conclusion and further study was required. Itak really needs to run simulations in the chamber at various temperature levels to determine the exact effect of temperature on focus. Since it requires a relatively long time for the chamber to stabilize (especially the collimator), a minimum of a week will be required to conduct such tests. Since neither chamber nor instrument are available outside the present production schedule, a weeks slippage in deliveries would be incurred if these tests were conducted. SMTD was directed to investigate this over-all scheduling problem and make a recommendation.

(c) Film length: I had requested that LMSC determine the maximum length of film that could be placed on the "C" supply spool with reliability. They determined that the film could be spooled to within 1/8 of an inch of the outer rim on the supply spool with no problems at all. The take-up spool can hold more than the supply spool, therefore, this interface is clean. A measurement was made with one roll of J-23-7600 and it was found to contain 7450 feet of film. While this is within 1 2% tolerance allowed, it was rather surprising to find the length this short. [redacted] is taking this up with Eastman-Kodak on his return. It is easily conceivable that we can put 7800 feet of film on the supply spool with no problem. In addition, it is felt that the confidence runs at base after loading and the system run on the pad can be cut down from the present number of cycles (which is about 250 feet of payload) to a new requirement for using only about 100 feet of film for check-out and countdown operations. This should make available about 7700 feet of film for each camera rather than the current 7200 feet of film. This extra 500 feet of film would be a significant increase in the operational capability. Supply spools of this length can not be available by Mission 9033 but could possibly be available by 9034.

(d) Auxiliary Frame Camera: The group was informed that the Configuration Control Board was calling on [redacted] as a consultant to review the camera problems. [redacted] from Itak was handcarrying SR's 70 and 90 to LMSC on 17 April 1962. Since #76 was returned from base and #73 is installed with #3 for Mission 9033, availability of frame camera is good providing the problem can be resolved.

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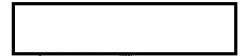
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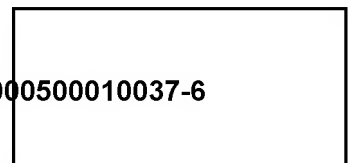
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